

**South Carolina Department of Health and
Environmental Control**

**Final Early Action Compact SIP
December 29, 2004**



South Carolina's Draft Early Action Compact SIP

1.1. Executive Summary

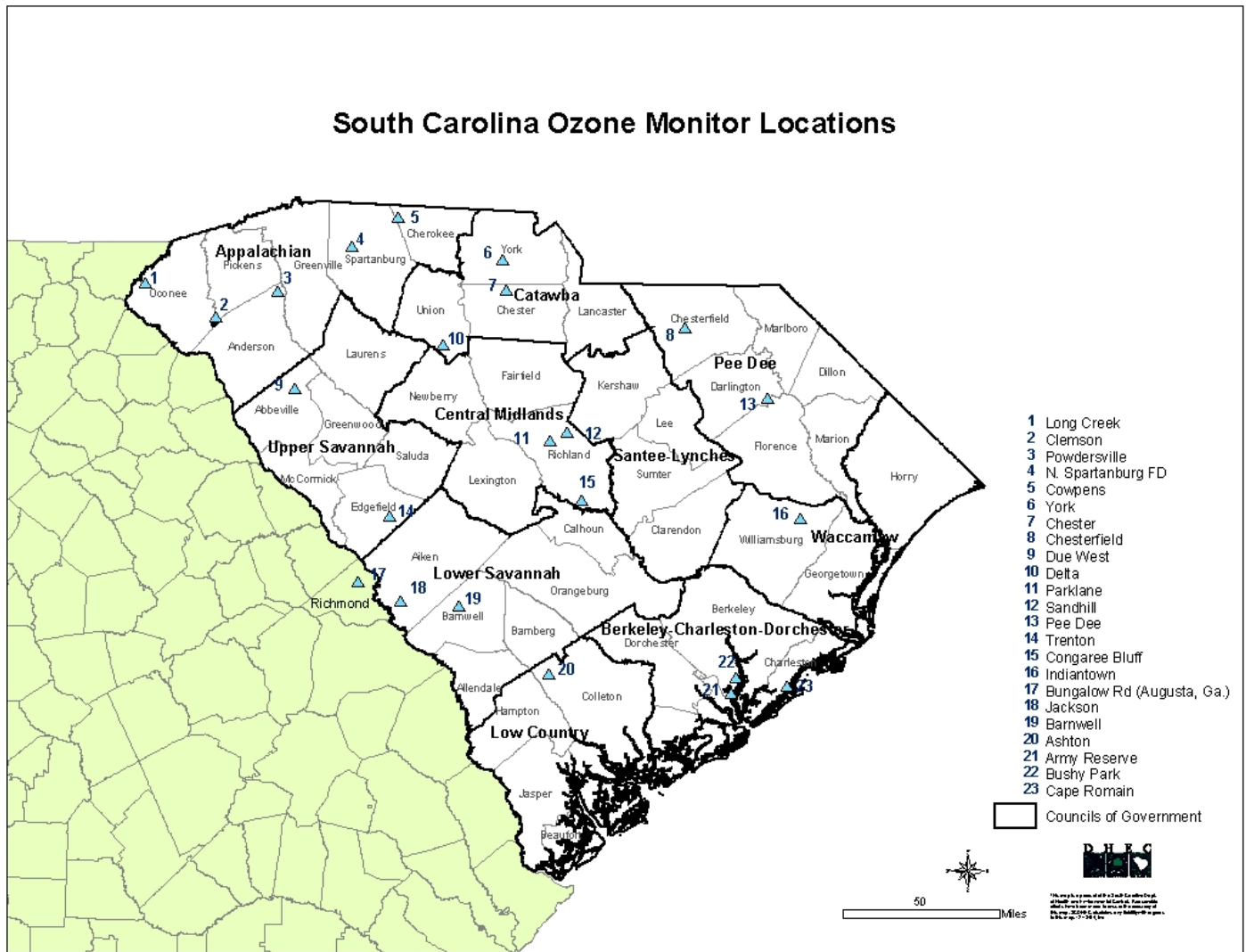
On July 19, 2002, the United States Environmental Protection Agency (EPA) endorsed a protocol for developing voluntary 8-hour ozone Early Action Compacts (EACs) (Appendix 1). EPA's stated purpose for the EAC process is to provide local areas with flexibility to control air emission from their sources and offer a means to achieve cleaner air sooner than the Clean Air Act requires. Only areas that are attaining the 1-hour ozone standard are eligible to participate in the EAC process. The compact requires these areas to attain the 8-hour ozone standard by December 31, 2007, a date that is sooner than would otherwise be required through the traditional nonattainment designation process. The compacts include all necessary elements of a comprehensive air quality plan, but are tailored to local needs and driven by local decisions. As a result of an area's participation, the EAC process calls for EPA to recognize the area's commitment to early action by provisionally deferring the effective date of the nonattainment designation. The deferral of the effective date of the designation is contingent upon the participating area's meeting all terms and key milestones of the compact. Further, the process provides for "fail-safe" provisions for the area to revert to the traditional process if specific milestones are not met.

In December 2002, the South Carolina Department of Health and Environmental Control (Department) entered into compacts with EPA and local governments for the purpose of bringing cleaner air sooner to the citizens of South Carolina (Appendix 2). Forty-five of forty-six counties signed compacts and they were grouped into the ten areas listed below:

1. Appalachian: Anderson, Cherokee, Greenville, Oconee, Pickens, Spartanburg
2. Catawba: Chester, Lancaster, Union, York
3. Pee Dee: Chesterfield, Darlington, Dillon, Florence, Marion, Marlboro
4. Waccamaw: Georgetown, Horry, Williamsburg
5. Santee Lynches: Clarendon, Kershaw, Lee, Sumter
6. Berkeley-Charleston-Dorchester: Berkeley, Charleston, Dorchester
7. Low Country: Beaufort, Colleton, Hampton, Jasper
8. Lower Savannah: Aiken, Allendale, Bamberg, Barnwell, Calhoun, Orangeburg
9. Central Midlands: Fairfield, Lexington, Newberry, Richland
10. Upper Savannah: Abbeville, Edgefield, Greenwood, Laurens, Saluda

Since that time, the Department has been meeting with local governments, industry representatives, environmental groups, and other interested parties, to develop state-wide regulations and assist in the development of local ozone reduction strategies to fulfill the commitments under the compacts. In accordance with the EAC process, on March 31, 2004, the Department submitted the final local early action plans to EPA. Based on this submittal and the EAC areas' continuing efforts, EPA published the first deferral of the effective date of the nonattainment designations on April 30, 2004. This final rule defers the effective date of nonattainment designations until September 30, 2005. In accordance with the compact requirements, the Department is providing the attached document to

fulfill its commitment to submit a final EAC SIP by December 31, 2004, consisting of local plans, all adopted control measures, and a demonstration that the areas will attain the 8-hour ozone standard by December 31, 2007.



1.2. Early Action Compact Requirements

The compacts that were signed by the Department, EPA, and local governments in December 2002, specify the requirements that must be met by participating EAC areas. These requirements are as follows:

- Milestones and Reporting (Attachment A)
- Emissions Inventories (Attachment B)
- Modeling (Attachment C)
- Control Strategies (Attachment D)
- Maintenance for Growth (Attachment E)

- Public Involvement (Attachment F)

The attached SIP submittal provides detailed discussions and documentation to support how the State and local areas have met their commitments with respect to the compact requirements.

1.3. Modeling Results

One of the key requirements of the EAC process is that areas attain the 8-hour ozone standard by December 31, 2007, and beyond. For a monitoring site to pass the attainment test, the three-year average of the annual fourth highest 8-hour ozone concentration must not exceed 84 parts per billion (ppb). The three-year average is based on monitoring results for the years 2005, 2006, and 2007. As discussed in Attachment C and then in more detail in Appendix 5, modeling indicates that the 2007 estimated design values for all sites are less than or equal to 84 ppb. Furthermore, the compacts require areas to address growth for five years beyond December 31, 2007, to ensure that the area remains in attainment. To demonstrate this, areas may use modeling analysis showing 8-hour ozone levels below the standard in 2012. The Department conducted modeling analysis for, not only 2012, but also for 2017 and the results as provided in Attachment E are that for 2012 and 2017 the estimated design values for all sites are less than or equal to 84 ppb.

1.4. Control Strategies

The modeling analysis described above demonstrates that all monitors in South Carolina will be attaining the 8-hour standard without the inclusion of measures beyond the national and regional programs already finalized. The *Protocol for Early Action Compacts* endorsed by EPA states that “after all Federal and State controls that have been or will be implemented by December 31, 2007, are accounted for in the modeling, the local area will identify additional local controls, as necessary, to demonstrate attainment of the 8-hour ozone standard on or before December 31, 2007.” While additional control measures from local areas were not needed to attain the 8-hour ozone standard by December 31, 2007, the State and local areas continued to move forward to develop strategies to reduce emissions in South Carolina to demonstrate their commitment to the process.

The EAC process encourages state and local areas to design control strategies that best fit their specific needs. As part of this process the Department began meeting in 2002 with local governments, industry representatives, environmental groups, and other state and federal agencies in an effort to develop state and local control strategies to reduce ozone precursors as part of the commitments under the compacts. The Department tackled these requirements from many different perspectives. First, the Department met regularly with the local EAC areas to consult with them and provide them with assistance on developing the local plans. Second, the Department formed stakeholder groups and conducted monthly meetings in an effort to develop state-wide regulations to achieve additional reductions in ozone precursors to support the EAC process. In addition, the Department

worked with several major NO_x emission sources in critical areas to seek agreements for additional source specific NO_x reductions. Also, in an effort to garner further support for the process from the state legislature and other state agencies, the Department worked successfully to get a concurrent resolution passed endorsing the process. Finally, the Department has conducted interagency meetings between air quality and transportation officials to develop a Smart Highways checklist to be used in transportation planning.

Most of the local measures described above are voluntary and will not be quantified, but will nonetheless have tangible benefits to air quality. For instance, with respect to the local measures described in Attachment D, some of the strategies adopted as part of this process include anti-idling measures for county vehicles, hosting gas can exchange programs, and assigning an air quality contact for the county who is responsible for disseminating air quality information. While these measures are difficult to quantify, they will still have a positive impact on air quality and raising awareness about air quality issues. Also, most of these local areas have attained the 8-hour ozone standard but are still engaged in this process to ensure that their areas continue to support air quality improvement efforts. Thus, the Department is including all local plans to demonstrate their commitment to the process. The local measures described in Appendix 16 demonstrate not only the commitment of the local areas but also the ownership that these areas are taking of this effort. They recognize the day-to-day activities that contribute to air quality. One such example of this is assigning an Air Quality Contact person in the County, responsible for disseminating the Ozone forecasts and related information on Ozone Action Days. Additionally, many counties have implemented carpooling programs and flex scheduling to coordinate with Ozone Action Days. Greenville County has committed to improving landscaping at all County facilities with the goal of improving the environment by minimizing turf areas and replacing them with shrubs, bed areas, and trees; enhance appearance; and reducing maintenance and associated costs. Greenville County, Georgetown County and Lexington County are implementing energy conservation measures to include sending reminders for employees to turn off lights and computers at the end of the day. Chester County has committed to plant 500 hardwood trees to help secure air quality and will also revise their purchasing policy to buy in bulk and reduce packaging. Georgetown County will develop a bike trail system in the county and will purchase electric cars for on site mobilizations. Sumter County will schedule maintenance activities to avoid peak time emissions during ozone alerts and has proposed changes to the current tree ordinance to protect existing trees in new developments. Many counties will consider the purchase of alternative fueled or more fuel-efficient vehicles when buying replacements. These are just a few of the behavioral changes being implemented in the counties that will provide air quality benefits now and in the future.

Among the key control strategies that were developed as part of the EAC process, were revisions to state-wide regulations for the purpose of providing additional reductions in ozone precursors. R.61-62.5 Standard 5.2, *Control of Oxides of Nitrogen*, and R.61-62.2, *Prohibition of Open Burning*, were published in the *South Carolina State Register* on June 25, 2004, and became effective upon publication (Appendix 9). R.61-62.5, Standard 5.2, *Control of Oxides of Nitrogen*, is a newly-developed regulation that applies to new and existing stationary sources that emit or have the potential to emit NO_x generated from

fuel combustion. This regulation sets standards for new construction based on Best Available Control Technology (BACT) standards from the national RACT/BACT/LAER Clearinghouse. For new sources, the regulation is primarily directed at smaller sources that fall below the Prevention of Significant Deterioration (PSD) thresholds and therefore would otherwise be exempt for NO_x controls altogether. R.61-62.2, *Prohibition of Open Burning*, is an existing state regulation that has been revised as part of this process to seek additional NO_x and VOC reductions. Specifically, the regulation was revised to clearly ban the burning of household trash statewide and therefore, in all local EAC areas. Prior to this revision, household trash was allowed to be burned when other disposal options were unavailable. Deleting this exemption removes any ambiguity in the regulation with respect to the burning household trash and will be helpful to the Department with respect to the enforcement of this provision and will also help us to achieve addition reductions in ozone precursors. In addition, the exemption for the burning of construction waste was revised to allow only residential construction waste to be burned if certain provisions are met such as the requirement that only clean lumber be burned and only outside of the ozone season. Other construction waste that is not associated with the building and construction of one and two family dwellings is strictly prohibited.

While information pertaining to the amount of NO_x and VOC reductions that are expected as a result of these regulations is provided in Attachment D, it is important to note that modeling indicates that all monitors will be attaining the 8-hour standard by 2007 even without these additional measures. However, the reductions from these regulations are quantifiable, permanent and will ensure that South Carolina obtains cleaner air sooner and helps ensure continued maintenance of the 8-hour ozone standard in the future. For example, R.61-62.5, Standard 5.2, became effective in June of 2004. Since that date, the Department has permitted two 12.56mmBtu/hr boilers at the Oconee Memorial Hospital that were required to install low NO_x burners as a result of this regulation. These are the types of smaller sources that would otherwise not be required to install NO_x controls. Furthermore, we have received and are in the process of permitting several additional applications from facilities that will be impacted by this regulation.

Another significant control strategy that was developed through this process is the voluntary commitments that the Department has negotiated with several of the state's largest existing industrial sources to reduce and/or limit their NO_x emissions. These negotiations were the direct result of the EAC process as are the NO_x reductions that will result from them. These voluntary commitments are described in more detail in Attachment D, but in summary, SCE& G – Wateree in Richland County has agreed to take permit limits on two coal-fired boilers and International Paper in Richland County has agreed to take an annual allowable NO_x emission reduction of 1000 tons, facility-wide. In addition, Duke Power in Anderson County has voluntarily agreed to install advanced low NO_x burners on two coal-fired boilers. This is a \$7 million investment by Duke Power that will result in approximately 850 tons of NO_x reduced annually. Finally, as part of this process, Transcontinental Gas Pipeline Corporation (Transco) which operates the internal combustion engines at Station 140 in Spartanburg County, has agreed to begin early implementation of the NO_x emission reductions required by Phase

II of EPA's NOx SIP Call regulation. In accordance with the federal requirements, Phase II is required to be fully implemented by 2007. As part of the EAC process, Transco has begun engine overhauls and engine combustion modifications so that these NOx emission reductions can be fully implemented by December 2005, well ahead of the federal timeline.

The Department believes that the sum of all these efforts will have a very real and positive impact on the health and environment of South Carolina. The EAC process has allowed the state of South Carolina to achieve reductions in ozone precursors from a variety of sources that otherwise would not have occurred and this was all done on a timeframe that was sooner than what would be required through the traditional nonattainment designation process. In addition, as a result of the local EAC plans and local efforts, awareness of air quality issues has been raised to a level that would not have been possible without the EAC process. People from around the state, who have never previously had any significant exposure to air quality issues, have participated in the EAC process and helped make decisions about improving air quality. This is perhaps, above all else, the reason why the South Carolina Wildlife Federation chose to honor the "SCDHEC Early Action Compact SIP" with their 2005 South Carolina Wildlife Federation Air Conservation Award, an award that has only been bestowed six times since 1970 (see Appendix 15).

1.5 List of Appendices

Appendix 1 – EPA Protocol for Early Action Compacts (June 19, 2002)

Appendix 2 – South Carolina Early Action Compacts

Appendix 3 - 8-hour Ozone Modeling Analysis and Attainment Demonstration: Technical Protocol

Appendix 4 – 8-hour Ozone Modeling Analysis and Attainment Demonstration: Technical Support Document Executive Summary

Appendix 5 – 8-hour Ozone Modeling Analysis and Attainment Demonstration: Technical Support Document

Appendix 6 – 8-hour Ozone Modeling Analysis and Attainment Demonstration: Georgia EPD Modeling Data

Appendix 7 – Letters sent to EPA to meet the milestones and reporting requirements of the Early Action Compacts

Appendix 8 – Local Early Action Plans

Appendix 9 – Early Action Compact Regulations

Appendix 10 – Memorandums of Agreement and Letters of Commitment

Appendix 11 - Concurrent Resolution - H.3914

Appendix 12 - Smart Highways Checklist

Appendix 13 – Estimated Emission Reductions Achieved by Regulation 61-62.2, Prohibition of Open Burning, and Regulation 61-62.5, Standard 5.2, *Control of Oxides of Nitrogen*

Appendix 14 – Letters to EPA Concerning Selection of 1998 Emissions Inventory

Appendix 15 – Letter from the South Carolina Wildlife Federation concerning the 2005 South Carolina Wildlife Federation Air Conservation Award

Appendix 16 - County Level Emission Reductions and Descriptions For the Ozone Early Action Compact Areas

Appendix 17 – Augusta Early Action Compact Ozone State Implementation Plan Revision

Appendix 18 – Episode Selection for the 1993, 1996, 1997, & 1998 Ozone Season Using the EPA Method

Attachment A

Milestones and Reporting

A. Milestones and Reporting

The compacts that were signed by the Department, EPA and local governments include clearly measurable milestones that are critical to assess the compact's development. Meeting these milestones is an important tool to measure the success of the EAC process and ensure that the areas are making progress towards developing and implementing the early action SIP. For continued participation in this process, the EACs include "key" milestones that must be met. To date, the participating areas have met all of the milestones required by their EACs. As a result, EPA proposed in the Federal Register, December 16, 2003, that when it promulgated the designations for certain areas of the country not meeting the 8-hour ozone standard, EPA will issue the first of three deferrals of the effective date of the designation for any EAC area that is designated nonattainment and continues to meet all compact milestones. As stated in the Federal Register, the EPA believes this program provides an incentive for early planning, early implementation and early reductions of emissions leading to expeditious attainment and maintenance of the 8-hour ozone standard. The EPA also noted that the EACs give local areas the flexibility to develop their own approach to meeting the 8-hour ozone standard. On April 30, 2004, with an effective date of June 15, 2005, EPA issued the air quality designations and classifications for areas for the 8-hour ozone standard. In this rulemaking, EPA also promulgated the first deferral of the effective date, to September 30, 2005, for the nonattainment designation for EAC areas that have met all milestones through March 31, 2004.

The following table outlines all the milestones agreed to in the compacts including those eight "key" milestones in **bold**, required for continued participation in the EAC process. Information regarding the status of each milestone completed to date is included. In addition, copies of the compacts are provided as Appendix 2 and copies of letters to EPA are provided as Appendix 7 to provide further evidence of the commitment of the South Carolina EAC areas toward meeting the goals of the compacts.

DATE	MILESTONE	STATUS
12/31/02	EAC signed by all parties and submitted to EPA	45 counties entered into EAC's with the Department and EPA. Three separate submittals to EPA were made on: December 20, 2002; December 27, 2002; and, December 31, 2002.
12/31/02	Initial modeling emissions inventory completed	This was addressed in correspondence to Mr. J.I. Palmer, Regional Administrator, EPA Region 4 on December 20, 2002.
12/31/02	Base case modeling completed	This was addressed in correspondence to Mr. J.I. Palmer, Regional Administrator, EPA Region 4 on December 20, 2002.
06/16/03	Discussion of control measures	This was addressed in correspondence

DATE	MILESTONE	STATUS
	being considered to EPA	sent to Mr. J. I. Palmer, EPA Region 4 Administrator on June 13, 2003.
10/31/03	Future case modeling	This was addressed in correspondence sent to Mr. J. I. Palmer, EPA Region 4 Administrator on December 19, 2003.
12/03	Progress report made available to EPA and public	This was addressed in correspondence sent to Mr. J. I. Palmer, EPA Region 4 Administrator on December 19, 2003.
12/31/03	Emission inventory comparison and analysis	This was addressed in correspondence sent to Mr. J. I. Palmer, EPA Region 4 Administrator on December 19, 2003.
01/31/04	One or more modeled control cases (initial)	This was addressed in correspondence sent to Mr. J. I. Palmer, EPA Region 4 Administrator on March 31, 2004.
01/31/04	Attainment maintenance analysis (initial)	This was addressed in correspondence sent to Mr. J. I. Palmer, EPA Region 4 Administrator on March 31, 2004.
03/31/04	2007 future year modeling emissions inventory	This was addressed in correspondence sent to Mr. J. I. Palmer, EPA Region 4 Administrator on March 31, 2004.
03/31/04	Final revisions to one or more modeled control cases	This was addressed in correspondence sent to Mr. J. I. Palmer, EPA Region 4 Administrator on March 31, 2004.
03/31/04	Final revisions to attainment maintenance analysis	This was addressed in correspondence sent to Mr. J. I. Palmer, EPA Region 4 Administrator on March 31, 2004.
03/31/04	Final local early action plan submitted to DHEC; copy to EPA	This was addressed in correspondence sent to Mr. J. I. Palmer, EPA Region 4 Administrator on March 31, 2004.
06/04	Progress report made available to EPA and public	This was addressed in correspondence sent to Mr. J. I. Palmer, EPA Region 4 Administrator on June 29, 2004.
12/31/04	Early Action State Implementation Plan submitted to EPA for incorporation into SIP	Draft EAC SIP submitted to EPA on October 22, 2004.
04/01/05	Local/State control strategies needed to demonstrate attainment implemented no later than this date	Updates will be provided at the time of this milestone.
09/30/05	EPA takes final action on SIP submitted December 31, 2004	EPA Action.
06/30/06	State submits progress report	Updates will be provided at the time of

DATE	MILESTONE	STATUS
	to EPA	this milestone.
12/31/07	Attainment of the 8-hour ozone standard	Updates will be provided at the time of this milestone.

Attachment B
Emissions Inventories

B.1. Emissions Inventories

This section discusses the development of the base-year emission inventory for the May 1998 modeling episode period and the future year emission inventory for the 2007 future period.

The Department has chosen to use 1998 emissions data for the most current year instead of 1999 data. There are two reasons for this choice. First, the 1998 inventory is considered more representative and conservative than the 1999 emissions inventory. When compared with 1998 emissions, the 1999 emissions decrease for both NO_x and VOCs. For VOCs, the reduction is 26.7%, and for NO_x the reduction is 5.3%. Second, these inventories were created prior to EPA guidance calling for 1999 or later emissions data to be used. If these inventories were recreated using 1999 data, South Carolina would likely not be able to meet the deadlines for completion of the modeling and would face a tremendous financial cost in developing the new inventories. Substantial resources were expended to get the 1998 emission inventories to their current status and a change would have been a poor financial choice given the minimal benefit using later data would provide. Appendix 14 contains letters sent to EPA providing additional information concerning the selection of the 1998 inventory.

While developing the mobile source inventory to be used in the base case ozone modeling analysis, some discrepancies were noted. When comparing EPA's 1999 National Emissions Inventory (NEI) version 2 emissions data to the 1998 emissions generated by South Carolina to be used in ozone modeling, it was found that the 1999 NEI data were almost 20% higher for on-road mobile daily NO_x emissions. This seemed very high, especially compared to the little difference from the other sources of NO_x and also from CO and VOC. This issue was investigated further to see what might be causing this large difference. A sort of the on-road mobile NO_x emissions in the NEI data tables revealed that some of the smaller population counties in the state were near the top for NO_x emissions. Most of the higher NO_x emissions came from light duty gas vehicles (LDGV) on rural interstates. Further investigation indicated the method used for allocating vehicle miles traveled (VMT) to the county and road type levels was causing the differences in NO_x emissions. The total annual statewide VMT used in the 1999 NEI and in the SC 1998 ozone modeling study are very similar. SC used 1998 annual VMT by county and road type, collected by the South Carolina Department of Transportation (SCDOT). These numbers are based on actual road studies by the SCDOT. The 1999 NEI VMT starts out with SCDOT annual VMT, which is reported to the Federal Highway Administration (FHWA) who enter the data in the Highway Performance Management System (HPMS). EPA takes this annual number and allocates it temporally by county and road type, using different allocation factors. According to Laurel Driver of the EPA's Office of Air Quality Planning and Standards (EPA-OAQPS), the contractor for the 1999 NEI allocated the VMT data to rural interstates using the actual miles of rural interstate in each county. Distributing the VMT in this manner resulted in more VMT being put on rural interstates than what the actual road count data indicated in 1998. Rural interstates typically have a higher emission factor than the other road types because of the high speeds. This explains much of the difference between the two years'

emissions. In summary, the 1998 on-road mobile emissions were calculated using actual 1998 VMT, and the 1999 NEI v.2 on-road mobile emissions were calculated with VMT data generated by the use of multiple allocation factors. Using actual VMT data is more representative than using VMT developed by allocation factors.

B.2. Base Year Inventory

A 1998 emissions inventory was developed for use as the current year emissions inventory. The emission-processing tools used in preparing the inventory are EPA's Urban Airshed Model (UAM) Emission Preprocessor System Version 2.5 (EPS 2.5), MOBILE 6, NONROAD and BEIS-2.

The modeling inventories for the episode were prepared based on the following information:

- 1996 National Emissions Trend (NET) Version 3 emission inventory.
- Emissions data provided by states for specific years.
- Episode-specific emissions data provided by individual facilities.

The 1996 NET inventory includes annual and ozone season daily emissions for oxides of nitrogen (NO_x), volatile organic compounds (VOC), carbon monoxide (CO), sulfur dioxide (SO₂), particulate matter with a diameter less than 10 and 2.5 microns (PM₁₀ and PM_{2.5}), and ammonia (NH₃). Since the modeling inventories were prepared for use in ozone modeling applications, the ozone season daily emissions of NO_x, VOC, and CO from NET 96 were used for the modeling analysis.

To facilitate development of the detailed emission inventories required for photochemical modeling for this analysis, EPA's UAM Emission Preprocessor System, Version 2.5 (EPS 2.5) was used. This system, developed by Systems Applications International (SAI) under the sponsorship of the EPA's Office of Air Quality Planning and Standards, consists of series of computer programs designed to perform the intensive data manipulation necessary to adapt a county-level annual or seasonal emission inventory for modeling use. EPS 2.5 provides the capabilities and allows for the evaluation of proposed control measures for meeting Reasonable Further Progress (RFP) regulations and special study concerns.

Area source emissions for the states included in the modeling domain were generated based on the 1996 NET Version 3 emission inventory, with three exceptions. Data for the following areas were provided by their respective states, and supplemented by 1996 NET Version 3 data for source categories not available in state data:

- 1998 county-level emissions for South Carolina.
- 1996 county-level emissions for Mississippi.
- 1999 county-level emissions for Hamilton and Davidson, Tennessee.

County-level emission estimates for the majority of non-road mobile source emissions were developed using EPA's draft NONROAD model (June 2000 version) with the May maximum, minimum and average temperatures by state (provided by EPA's "National Air Pollutant Emission Trends, Procedures Document for 1990-1996"). Aircraft, commercial marine vessels, and locomotives were not included in the NONROAD model, and the emissions for those categories were taken from the 1996 NET database. The 1999 county-level aircraft emissions provided by the Department were also incorporated in the inventory.

The on-road mobile source emissions were prepared using MOBILE6 and county-level daily vehicle miles traveled (VMT) data for the states of South Carolina, North Carolina, Georgia and Tennessee. The 1996 NET Version 3 on-road mobile emissions were used for the other states within the modeling domain.

For the other states, the on-road mobile source emissions were generated based on the 1996 NET Version 3 data. The growth and adjustment factors developed by Department of Civil and Environmental Engineering, University of Tennessee were applied to the NET 96 data to project emissions from the 1996 MOBILE 5b level to the 1998 MOBILE 6 level.

The point source emission inventory was prepared based on emissions provided by the states of Alabama, Mississippi, South Carolina, North Carolina, and Tennessee. Emissions for the other states were based on the NET 96 Version 3 data base. Southern Company and the utilities in South and North Carolina provided episode-specific point source emissions.

B.3. Future Year Inventory

The projection of a base year emission inventory to a future year requires the use of economic growth factors. These are applied to the various industrial sectors and source categories to reflect expected future growth (or decline) in industrial activity and resulting emissions. There are five sets of factors available for use in projecting emission inventories for modeling. The Bureau of Economic Analysis (BEA) provides three such sets, while another two sets are available in EPA's Economic Growth Analysis System (EGAS). For ozone SIP modeling exercises, EPA guidance does not state a preference of which set to use, but does recommend that local growth information be considered in the selection and use of such factors. The BEA projection series provides state-level personal earnings, employment, and gross state product (GSP - value added) data for selected years through the year 2045, and the projection factors are available at 2-digit SIC code level for point sources and 4-digit Aerometric Information Retrieval System (AIRS) Source Category (ASC) code level for area sources. The latest set of growth factors provided by BEA was issued in 1995; BEA no longer publishes growth factors. The EGAS system includes both BEA factors and two other sets of growth factors that purportedly provide more detailed information geographically and by source category. The EGAS provides the county-level growth factors for area sources at the 10-digit ASC code level, and growth factors for point sources at the 2-digit SIC code level with

associated fuel type or 8-digit SCC code. The two sets of factors provided by EGAS are from the Bureau of Labor Statistics (BLS) and from Wharton Econometric Forecasting Associates (WEFA). Although the EGAS system purports to provide growth factors by county, for the State of South Carolina and all other surrounding states, all of the factors contained in the latest version of EGAS are the same for all counties within each state – there are no county-to-county differences.

For the South Carolina EAC modeling analysis, the future-year emission inventories for 2007, 2012, and 2017 were developed using economic growth factors provided by the BEA. Specifically, the state-specific Gross State Product (GSP) factors were used for South Carolina and all other states within the modeling domain. The selection of the BEA factors was not based on any assessment of the quality or accuracy of BEA vs. EGAS. EPA guidance does recommend that value added projections be used, and BEA's GSP factors are a measure of value added and a more complete measure of growth than BEA's earnings factors, which are only one component of GSP. The BEA GSP factors have been used recently by EPA in ozone and particulate matter modeling conducted to support national rulemaking for the Tier 2 engine and fuel sulfur standards, the non-road diesel engine rulemaking, Clear Skies, and most recently, in the Clean Air Interstate Rule (CAIR) modeling analysis.

The future-year growth estimates for area sources were based on BEA projections of GSP for all states. The BEA projections were applied at the 4-digit AIRS Source Category (ASC) level for area sources, and represent growth between the base year and future year of 2007.

For area sources with fuel combustion, energy adjustment factors which were developed from the Department of Energy (DOE) publication "Annual Energy Outlook 1999," were applied to the baseline emissions to account for increases in fuel and process efficiency in 2007, 2012, and 2017.

VOC controls were applied to area sources using information provided by EPA. The controls include federal initiatives, such as VOC content limits for consumer solvents; Title III maximum achievable control technology (MACT) assumptions; and Title I reasonably available control technology (RACT) assumptions that were not applied in the 1998 base year inventory.

Future-year growth estimates were provided by the electric utilities located North Carolina and South Carolina along with Southern Company and Tennessee Valley Authority (TVA). The future-year growth estimates for all other point sources located in the domain were based on BEA GSP projections. The BEA projections were applied at the 2-digit Standard Industrial Classification (SIC) level for point sources, and represent growth between the base year and future year of 2007.

For fuel combustion sources, energy adjustment factors which were developed from DOE publication "Annual Energy Outlook 1999," were applied to the baseline emissions to account for increases in fuel and process efficiency in 2007.

The Clean Air Act (CAA) controls include federal initiatives that were applied to the non-utility point sources. In addition, MACT controls for NO_x and VOC were applied to the non-utilities.

The emission controls required by the EPA's Regional NO_x SIP Call were emulated for the point sources located in the modeling domain covered by the SIP Call, i.e., the States of Alabama, Georgia, Illinois, Indiana, Kentucky, Maryland, Missouri, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia. The NO_x SIP Call controls were applied to the point sources located north of the 32-degree latitude line in the states of Alabama and Georgia.

County-level emission estimates for the majority of non-road mobile source emissions were developed using EPA's draft NONROAD2002 model with May maximum, minimum, and average temperatures by state as provided in EPA's "National Air Pollutant Emission Trends, Procedures Document for 1990-1996."

Emissions of aircraft, commercial marine vessels, and locomotives were projected from 1996 levels to future year levels using the BEA GSP growth factors.

The on-road mobile source emissions were prepared using MOBILE6. Future year emissions estimates from MOBILE6 include benefits from EPA's Tier II standards and low sulfur fuels. Data were provided by the States of Alabama, Georgia, South Carolina, North Carolina, and Tennessee, and used for 2007. For the other states, the on-road mobile source emissions were prepared using MOBILE6 and state-level 2007/2012/2017 VMT data provided by FHWA. The state-level VMT data were distributed to the county-level using the 2000 Census population as a surrogate.

Additional information on the development of the emissions inventories may be found in the 8-hour Ozone Modeling Technical Support Document (Appendix 5).

Attachment C

Modeling

C. Modeling

The South Carolina 8-hour ozone modeling study was initiated in January 2000 and was designed to provide technical information relevant to attainment of an 8-hour National Ambient Air Quality Standard (NAAQS) for ozone in South Carolina, with emphasis on the Anderson/Greenville/Spartanburg, Aiken/Augusta, Columbia, Florence/Darlington, and Rock Hill areas.

The technical support document uses a different naming convention for the modeled areas. The correlation between the Early Action Compact area name and the modeled area name are shown in Table C-1.

Table C-1.
Naming convention for EAC Areas to modeled areas.

EAC Area	Modeled Area
Appalachian	Anderson/Greenville/Spartanburg
Catawba	Rock Hill
Pee Dee	Darlington/Florence
Waccamaw	Coastal Sites
Santee Lynches	Not Applicable
Berkeley, Charleston, Dorchester	Coastal Sites
Low Country	Coastal Sites
Lower Savannah	Aiken/Augusta
Central Midlands	Columbia
Upper Savannah	Anderson/Greenville/Spartanburg

The draft attainment demonstration procedures for 8-hour ozone differ from those for 1-hour ozone in several ways. A key difference is that the modeled attainment test is based on relative, rather than absolute, use of the modeling results. Thus, the test relies on the ability of the photochemical modeling system to simulate the change in ozone due to emissions reductions, but not necessarily its ability to simulate exact values for future-year ozone concentrations. Another difference is that the 8-hour attainment test is site-specific while the 1-hour test focuses on an urban-scale modeling domain. For 8-hour analysis, areas of the domain that are not monitoring sites are only considered as part of a “screening” test.

For a monitoring site to pass the attainment test, its future-year estimated design value must not exceed 84 ppb. Future-year estimated design values (EDVs) are calculated for each site, for each simulated day, using “current-year” design values and relative reduction factors (RRFs) derived from future-year and base-year modeling results. The current-year design value for a given site is the three-year average of the annual fourth highest measured 8-hour ozone concentration. The RRF is the ratio of future- to base-year 8-hour maximum ozone concentrations in the vicinity of that monitoring site. The EDV is obtained by multiplying the current-year design value by the RRF.

Maximum current and estimated design values for sites in South Carolina are given in Table C-2 (A, B, and C). This table shows the calculations of the relative reduction factors for 2007. For the Anderson/Greenville/Spartanburg area, these sites are the Powdersville monitor located in Anderson County and the North Spartanburg Fire Station monitor located in Spartanburg County. For the Columbia area this site is the Sandhill monitor located in Richland County. Table C-3 contains the maximum current and estimated design values for all of the monitoring sites in South Carolina. These monitors are grouped by geographic area. The calculation process for the relative reduction factor is the same as used in Table C-2 (A, B, and C). The EDV was calculated using the 2007 future year baseline as the basis for calculation of the RRF. For all sites, the EDV for 2007 is lower than the 1997-1999 DV. In addition, the values for all sites are less than or equal to 84 ppb. The 2001-2003 design value for these sites is also included in the table; the 2001-2003 design value was the data used to determine South Carolina's 8-hour ozone attainment status. The monitors indicating nonattainment based on 2001-2003 design values are shaded.

Table C-2a.
Simulated current and future year 8-hour ozone concentrations for the Powdersville (Anderson County) site for the Anderson/Greenville/Spartanburg area.

Simulation Date	Simulated Maximum 8-Hour Ozone (ppb)	
	1998	2007
5/18/98	79	68
5/19/98	76	68
5/20/98	82	69
5/21/98	71	60
5/22/98	72	65
5/23/98	70	66
Average	75	66
EDV Calculations		
RRF		0.88
1997-1999 DV		96
2001-2003 DV		86
EDV (1999)		84

Table C-2b.
Simulated current and future year 8-hour ozone concentrations for the North Spartanburg Fire Station (Spartanburg County) site for the Anderson/Greenville/Spartanburg area.

Simulation Date	Simulated Maximum 8-Hour Ozone (ppb)	
	1998	2007
5/18/98	78	69
5/19/98	77	66
5/20/98	82	70
5/21/98	76	64
5/22/98	74	70
5/23/98	72	67
Average	76	67
EDV Calculations		
RRF		0.88
1997-1999 DV		93
2001-2003 DV		87
EDV (1999)		82

Table C-2c.
Simulated current and future year 8-hour ozone concentrations for the Sandhill (Richland County)
site for the Columbia area.

Simulation Date	Simulated Maximum 8-Hour Ozone (ppb)	
	1998	2007
5/18/98	60 ¹	60 ¹
5/19/98	90	77
5/20/98	81	69
5/21/98	78	65
5/22/98	81	68
5/23/98	73	72
Average	80	70
EDV Calculations		
RRF		0.88
1997-1999 DV		91
2001-2003 DV		88
EDV (1999)		80

¹ Since the 5/18/98 maximum ozone concentration is less than 70 ppb, this day's ozone concentrations are not used in the calculation of the RRF.

Table C-3.
1997-1999, 2001-2003 8-hour ozone design values and 2007 estimated ozone design values for South Carolina ozone monitors.

Area/County	Monitor Name	1997-1999 Design Value (ppb)	2001-2003 Design Value (ppb)	2007 Estimated Design Value (ppb)
Aiken/Augusta				
Aiken	Jackson	89	81	73
Barnwell	Barnwell	88	78	71
Edgefield	Trenton	86	80	72
Richmond, GA	Augusta	92	83	77
Anderson/Greenville/Spartanburg Area				
Abbeville	Due West	87	82	78
Anderson	Powdersville	96	86	84
Cherokee	Cowpens	91	84	81
Oconee	Long Creek	87	84	74
Pickens	Clemson	91	84	81
Spartanburg	N. Spartanburg Fire Station	93	87	82
Union	Delta	83	81	74
Columbia Area				
Richland	Parklane	89	80	79
Richland	Sandhill	91	88	80
Richland	Congaree Bluff	72	77	65 ¹
Darlington/Florence Area				
Darlington	Pee Dee	88	82	77
Rock Hill Area				
Chester	Chester	92	84	83
York	York	87	84	78
Coastal Sites				
Berkeley	Bushy Park	79	72	70
Charleston	Army Reserve	76	71	66
Charleston	Cape Romain	80	72	71
Colleton	Ashton	83	77	68

Area/County	Monitor Name	1997-1999 Design Value (ppb)	2001-2003 Design Value (ppb)	2007 Estimated Design Value (ppb)
Williamsburg	Indiantown	75	71	62

¹ Since the Congaree Bluff design value for 2001-2003 is higher than the 1997-1999 design value, the 2001-2003 design value was used in the estimated design value calculation for 2007.

A screening test was also performed for areas within South Carolina. The purpose of the screening test is to identify areas within the modeling domain that have high simulated ozone levels but that are not near a monitor. Once identified, these areas are considered in the analyses of future year attainment.

The screening test is intended as an accompaniment to the attainment test and is specifically applied to areas in the domain where the simulated base-case maximum 8-hour ozone concentrations are consistently greater than any in the vicinity of a monitoring site. EPA guidance defines “consistently” to require 50 percent or more of the simulation days, and “greater than” as more than 5 percent higher. Thus, the screening test is designed to be applied to an array of grid cells where the simulated maximum 8-hour ozone concentrations are more than 5 percent higher than any near a monitored location, on 50 percent or more of the simulation days. The screening test procedures are otherwise identical to the attainment test procedures; the current-year design value for the unmonitored area is set equal to the maximum value at any site.

No candidate grid cells for application of the test were identified. Thus, the screening test is passed and there is no need to designate additional areas in which to estimate a future design value.

The 2007 future-year baseline simulation was used as the basis for emissions-based sensitivity simulations. The sensitivity runs modeled changes in anthropogenic NO_x and VOC emissions to assess the modeling system’s sensitivity to changes in emissions. SCDHEC performed eight sensitivity runs consisting of the following:

- 15 percent reduction in NO_x emissions
- 35 percent reduction in NO_x emissions
- 15 percent reduction in VOC emissions
- 35 percent reduction in VOC emissions
- 15 percent reduction in both NO_x and VOC emissions
- 35 percent reduction in both NO_x and VOC emissions
- 35 percent reduction in NO_x emissions, 15 percent reduction in VOC emissions
- 15 percent reduction in NO_x emissions, 35 percent reduction in VOC emissions

Summary

Application of the modeled attainment test indicates that:

- The average estimated design value (EDV) for 2007 is approximately 10 ppb lower than the 1997-1999 observation-based design value.
- 2007 EDVs for all sites are less than or equal to 84 ppb.
- The attainment test is passed for all sites for the 2007 scenario.

Application of the screening test indicates that:

- There are no ozone “hot spots” within the state that fall outside of the monitoring network, based on the simulation results for the May 1998 modeling episode period.

The emissions sensitivity runs for NO_x and VOC indicate that:

- South Carolina ozone production is sensitive to changes in NO_x emissions. Additional reductions in NO_x emissions should have more impact on ozone production than additional reductions in VOC emissions.
- There are no additive or synergistic effects from combined reductions of NO_x and VOC. In isolated cases there are ozone disbenefits from combined reductions of anthropogenic NO_x and VOC.

Additional information on South Carolina’s ozone modeling is available in Appendices 3, 4, and 5. These appendices contain the executive summary, modeling protocol, and technical report summarizing the methods and results of the photochemical modeling application for South Carolina. The modeling effort included the application of the variable-grid Urban Airshed Model (UAM-V) photochemical modeling system for one multi-day simulation period, evaluation of model performance, and use of the modeling system to estimate ozone concentrations for 2007, 2012, and 2017.

Attachment D
Control Strategies

D.1. South Carolina's EAC Control Strategies

The modeling analysis demonstrates that all monitors in South Carolina will be attaining the 8-hour standard without the inclusion of measures beyond the national and regional programs already finalized. The *Protocol for Early Action Compacts* states that “after all Federal and State controls that have been or will be implemented by December 31, 2007, are accounted for in the modeling, the local area will identify additional local controls, as necessary, to demonstrate attainment of the 8-hour ozone standard on or before December 31, 2007.” While additional control measures from local areas were not needed to attain the 8-hour ozone standard by December 31, 2007, the State and local areas continued to move forward to develop strategies to reduce emissions in South Carolina to demonstrate their commitment to the process.

The EAC process encourages state and local areas to design strategies that are tailored to their specific needs. As part of the EAC process, the Department began meeting in 2002, with local governments, industry representatives, environmental groups, and other state and federal agencies in an effort to develop state and local control strategies to reduce ozone precursors as part of the commitments under the compacts. The Department tackled these requirements from many different perspectives. First, the Department met regularly with the local EAC areas to consult with them and provide them with assistance on developing their local plans. Second, the Department formed stakeholder groups and conducted monthly meetings in an effort to develop state-wide regulations to achieve additional reductions in ozone precursors to support the EAC process. In addition, the Department worked with several major NO_x emission sources in critical areas to seek agreements for additional source specific NO_x reductions. Also, in an effort to garner further support for the process from the state legislature and other state agencies, the Department worked successfully to get a concurrent resolution passed endorsing the process. This resolution was signed by Governor Sanford on May 14, 2003, and provides for the establishment of an intergovernmental workgroup for the purpose of promoting behaviors and policies to reduce air pollution in this state. Finally, the Department has conducted interagency meetings between air quality and transportation officials to develop a Smart Highways checklist to be used in transportation planning.

The Department believes that the sum of all these efforts will have a very real and positive impact on the health and environment of South Carolina. The EAC process has allowed the state of South Carolina to achieve reductions in ozone precursors from a variety of sources that otherwise would not have occurred and this was all done on a timeframe that was sooner than what would be required through the traditional nonattainment designation process. In addition, as a result of the local EAC plans and local efforts, awareness of air quality issues has been raised to a level that would not have been possible without the EAC process. People from around the state, who have never previously had any significant exposure to air quality issues, have participated in the EAC process and helped make decisions about improving air quality. This is perhaps, above all else, the reason why the South Carolina Wildlife Federation chose to honor the “SCDHEC Early Action Compact SIP” with their 2005 South Carolina Wildlife Federation Air Conservation Award, an award that has only been bestowed six times since 1970 (see Appendix 15).

D.2. Local EAC Plans

Forty-five of forty-six counties in South Carolina have signed EACs with the Department and the EPA Region 4 office. These counties were grouped into the following ten separate areas:

Appalachian: Anderson, Cherokee, Greenville, Oconee, Pickens, Spartanburg

Catawba: Chester, Lancaster, Union, York

Pee Dee: Chesterfield, Darlington, Dillon, Florence, Marion, Marlboro

Waccamaw: Georgetown, Horry, Williamsburg

Santee Lynches: Clarendon, Kershaw, Lee, Sumter

Berkeley-Charleston-Dorchester: Berkeley, Charleston, Dorchester

Low Country: Beaufort, Colleton, Hampton, Jasper

Lower Savannah: Aiken, Allendale, Bamberg, Barnwell, Calhoun, Orangeburg

Central Midlands: Fairfield, Lexington, Newberry, Richland

Upper Savannah: Abbeville, Edgefield, Greenwood, Laurens, Saluda

For continued participation in this process, the EACs include milestones that must be met. To date, the participating areas have met all of the milestones required by their EACs. See Attachment A for further discussion regarding milestones and reporting requirements. As a result of these areas meeting all of the milestones, EPA proposed in the Federal Register, December 16, 2003, that when it promulgated the designations for certain areas of the country not meeting the 8-hour ozone standard, EPA will issue the first of three deferrals of the effective date of the designation for any EAC area that is designated nonattainment and continues to meet all compact milestones. As stated in the Federal Register, the EPA believes this program provides an incentive for early planning, early implementation and early reductions of emissions leading to expeditious attainment and maintenance of the 8-hour ozone standard. The EPA also noted that the EACs give local areas the flexibility to develop their own approach to meeting the 8-hour ozone standard. On April 30, 2004, with an effective date of June 15, 2005, EPA issued the air quality designations and classifications for areas for the 8-hour ozone standard. In this rulemaking, EPA also promulgated the first deferral of the effective date, to September 30, 2005, for the nonattainment designation for EAC areas that have met all milestones through March 31, 2004.

Again, because the modeling shows attainment with the 8-hour ozone standard by December 2007, and maintenance through 2012 and 2017, further reductions local control strategies are not necessary. For the most part, the local strategies being implemented are voluntary, and therefore the reductions from these efforts are considered “directionally sound” and will not be quantified for use in support of modeling assumptions. Local strategies that are enforceable will be enforced by the local government.

Addendums for the Early Action Plans submitted in March 2004, by Anderson, Greenville, Lexington, Richland, and Spartanburg Counties have also been included in Appendix 8. After additional consideration of the emission reduction efforts submitted in March 2004, these counties elected to include additional reduction efforts in their local Early Action Plans to be submitted as a part of the Early Action SIP. The addendums clearly identify and describe measures the local government is committed to implement through the adoption of a county policy. While these measures have been identified, they are directionally sound, but not easily quantifiable. The emissions reduction benefits include promoting healthy lifestyle and quality of life. Examples include reductions in vehicle miles traveled (VMT) (i.e., carpooling, flex-scheduling); reduction in fuel consumption and/or cleaner fleets (i.e., idling restrictions, alternative fuels, alternative fuel vehicles or hybrids); energy conservation; and outreach efforts (i.e., notification of Ozone Action Days; ensure county residents aware of State restrictions on outdoor burning; implementing open burning ban within the county). A complete copy of each of the local plans and the addendums is included as Appendix 8. Additionally, Appendix 16 includes county level emission reductions and descriptions for the ozone EAC areas.

To date many EAC areas have begun to seek help and support from the Department's Bureau of Air Quality with their outreach initiatives to citizens in their areas. Many have identified a person on staff at the county level to receive the ground-level ozone forecast provided by the Bureau. This forecast is further distributed by this contact to others in the county to increase awareness of ground-level ozone concentrations and to take appropriate measures to protect their health. This past forecast season a toll-free line was added to help those persons without internet access the ability to call in to hear the forecast message for their area.

Department staff has met with several EAC representatives to learn of specific outreach needs in their areas. Resource tools were shared, including materials from EPA's "It All Adds Up to Cleaner Air," which Bureau staff tailored to these local areas. Furthermore, utilizing the Department's art department, radio public service announcements have been developed for several of the EAC areas to help increase awareness of ground-level ozone issues.

To build upon the awareness activities in the EAC areas, more focused efforts are being undertaken by staff to help assist and support these local efforts. For example, the Bureau's alternative commute project, "Take a Break from the Exhaust," has been packaged to enable local businesses and governments to implement with their employees. Some businesses and local county government representatives have already contacted our staff to request utilizing this project with employees. Specific values for emission reductions from this activity can be found in Appendix 16.

Another example of the active role local staff are taking is with the increased number of gas can exchange events that are occurring in the state. The Department has assisted numerous EAC contacts with planning and implementing these events. Events have been held in Greenville, Richland, Lexington, Greenwood, and York counties. This type of event has yielded tangible results for the contacts based on the number of old cans

collected and the number of newer, more environmentally safe cans distributed. The partnerships established with the private sector to purchase the newer gas cans has been a huge reason for the success of these events. Local industry partners have contributed funds to secure these cans, which have been utilized in events in several areas including the counties of Greenville, Lexington and Richland. Specific values for emission reductions from this activity can be found in Appendix 16.

The increase in efforts for improving the public's awareness of ground-level ozone issues by the EACs has helped to support efforts to implement these types of activities for encouraging citizens to do their part to "Help Spare the Air" in South Carolina. A key to the overall strategy in South Carolina to reach attainment for the ground-level ozone standard is to encourage our citizens to be active participants in the solution to reducing ozone pre-cursors. Based on the initial efforts at the local level, we are beginning to see progress.

D.3. State EAC Regulations

In the Spring of 2003, the Department began meeting with industry representatives, environmentalists, local governments, and other interested parties to develop state-wide regulations for the purpose of getting additional NO_x and VOC reductions to assist us with the EACs. NO_x reductions were focused on during these meetings because modeling indicates that with respect to ozone formation, NO_x is the critical pollutant. Furthermore, sensitivity analysis has demonstrated that VOC reductions have very little impact on ozone in South Carolina.

After meeting with stakeholders throughout the year, two regulations were proposed to assist with additional reductions: Regulation, 61-62.5, Standard 5.2, *Control of Oxides of Nitrogen*, and revisions to Regulation 61-62.2, *Prohibition of Open Burning*.

Regulation 61-62.5, Standard 5.2, *Control of Oxides of Nitrogen (NO_x)*, is a newly-promulgated, broad-based regulation that applies state-wide to new and existing stationary sources that emit NO_x from fuel combustion and have not undergone a best available control technology (BACT) analysis for NO_x. The regulation is designed primarily to assist with the issue of growth and is also geared toward smaller sources that fall below the applicability thresholds for prevention of significant deterioration (PSD). These are sources that, for the most part, would not otherwise be required to install NO_x controls. For new sources, the regulation requires the installation of control technology that is based on BACT standards found in the national RACT/BACT/LAER clearinghouse. For existing sources, the regulation only applies when an applicable unit replaces their burner. At this point, they will be required to replace their burner with a low burner or equivalent technology capable of achieving a 30% reduction from uncontrolled levels.

Appendix 13 provides estimated NO_x reductions that are expected as a result of this new regulation. These estimates have also been included in Appendix 16 as part of the county level emission reductions for the EAC areas. The tables in Appendix 13 are divided into

three groups (two tables provide expected NO_x from regulation 61-62.5, Standard 5.2, the third table provides reductions expected from the revisions to the open burning regulation). The first table in Appendix 13 provides estimates based on the percent reduction to be achieved for new sources. The reductions for new sources vary greatly depending on the source type. For instance, for new combined cycle natural gas turbines of less than 50 megawatts capacity will be required to install controls that will achieve the equivalent of a 94% reduction from uncontrolled levels. The control requirements will help ensure that the growth of NO_x emissions is controlled. The second table in Appendix 13 pertains to estimated reductions from existing sources. As this regulation will be triggered based on existing sources replacing their burners, it may take a number of years for these reductions to be realized. However, these estimates, based on the number of applicable sources in the inventory, indicate that when fully implemented, the regulation has the potential to reduce NO_x emissions by 2,913.51 tons per year.

It is important to note that these reductions were not used to support the modeling demonstration. Even without these additional control measures, which will apply statewide rather than just in select areas, modeling analysis indicates that all monitors will be attaining the standard by 2007. However, the reductions from these regulations are quantifiable, permanent and will ensure that South Carolina gets cleaner air sooner. For example, R.61-62.5, Standard 5.2, became effective in June of 2004. Since that date, the Department has permitted two 12.56mmBtu/hr boilers at the Oconee Memorial Hospital that were required to install low NO_x burners as a result of this regulation. These are the types of smaller sources that would otherwise not be required to install NO_x controls. Furthermore, we have received and are in the process of permitting several additional applications from facilities that will be impacted by this regulation.

The other regulation that was revised order to get additional reductions in ozone precursors as part of the EAC process was Regulation 61-62.2, *Prohibition of Open Burning*. The most significant revisions to this regulation are as follows: deleting the exception for the burning of household trash, revising the exception for the burning of construction waste, and revising the exception for fires set for the purpose of firefighter training. The burning of household trash presents health and environmental concerns for many communities. The smoke generated from these activities is a nuisance to some and a health threat to others with asthma or other respiratory problems. Furthermore, the Department spends a lot of staff time and resources responding to complaints relating to these activities. Regulation 61-62.2 had previously prohibited the burning of household waste except where other disposal options were not available. This activity is now clearly prohibited and this should provide the clarity necessary to help us enforce this restriction. With respect to the exception for the burning of construction waste, the Department has revised this provision to allow only residential construction waste to be burned and this will only be allowed if it meets the provisions of the regulation. For instance, such waste will now only be allowed to be burned outside of the ozone season (April 1 through October 30) and only if the burning is conducted at least five hundred feet from any occupied structure. Furthermore, only certain “clean” wastes are allowed to be burned. Again, the Department believes that the burning of construction waste presents health and environmental concerns for many and that prohibiting this waste from being burned will

alleviate some of these concerns and will also provide additional NO_x reductions. Finally, the exception for the purpose of firefighter training has been revised to ensure that minimum health, environmental and safety concerns are addressed. The Department intends to do a review of permanent firefighter training facilities and will evaluate non-permanent sites and require Department approval prior to a burn.

Based on the Department's 1999 emissions inventory, residential burning of household waste generates 2,379 tons of NO_x and 11,896 tons of VOCs in the state annually. As for the ban on the burning of construction waste, the data indicates that the ban on residential construction waste alone will result in annual reductions of 147 tons of NO_x and 625 tons of PM (see Appendix 13 for further information). Information on the amount of reductions to be expected from the ban on the burning of commercial construction waste is not available, but it is clear that substantial reductions in NO_x and VOCs will occur statewide starting in 2004 as a direct result of the elimination of this activity as well.

Additionally, Appendix 16 includes county level emission reductions and descriptions for the ozone EAC areas.

D.4. Memorandums of Agreement/Letter of Commitment

As part of the EAC process, several of the largest existing industrial sources in the Upstate and Midlands areas of South Carolina have voluntarily committed to reduce and/or limit their NO_x emissions. These negotiations were the direct result of the EAC process as are the NO_x reductions that will result from them. SCE& G – Wateree in Richland County is installing Selective Catalytic Reduction (SCR) on two coal-fired boilers to comply with the NO_x SIP Call and has agreed to take permit limits on these units as their commitment to the EAC process. International Paper in Richland County has agreed to take an annual allowable NO_x emission reduction of 1000 tons, facility-wide. In addition, Duke Power in Anderson County has committed to install and operate low NO_x combustion controls on two coal-fired boiler units (controls were installed in 2001 on the other boiler at the facility) and to limit the NO_x emissions from these units to an emission rate of 0.27lbs/MMBtu. This is a \$7 million investment by Duke Power that will result in approximately 850 tons of NO_x reduced annually. Finally, as part of this process, Transcontinental Gas Pipeline Corporation (Transco) which operates the internal combustion engines at Station 140 in Spartanburg County, has agreed to begin early implementation of the NO_x emission reductions required by Phase II of EPA's NO_x SIP Call regulation. In accordance with the federal requirements, Phase II is required to be fully implemented by 2007. As part of the EAC process, Transco has begun engine overhauls and engine combustion modifications so that these NO_x emission reductions can be fully implemented by December 2005, well ahead of the federal timeline. These actions by these facilities are not required by any federal or state regulation and are only being taken to demonstrate their commitment to the EAC process. Appendix 10 contains copies of these voluntary agreements.

D.5. Concurrent Resolution H.3914

The Department's commitment to meeting the 8-hour ozone standard will require a concerted effort by individuals and organizations, including other state agencies. As part of the EAC process, in 2003 the Department formed the Clean Air Initiatives for Governmental Entities (CAIGE) workgroup to help state government develop and implement a plan for reducing precursors to ground-level ozone emissions, which supports the goal of achieving "cleaner air sooner" in South Carolina. A product of the CAIGE workgroup was the submittal and subsequent adoption of a concurrent resolution (H.3914). This resolution was signed by Governor Sanford on May 14, 2003, and provides for the establishment of an intergovernmental workgroup for the purpose of promoting behaviors and policies to reduce air pollution in this state. (Appendix 11)

The Department is helping to lead an effort among state and local entities, to help our state meet the national standard for ground-level ozone. This proactive approach requires moving forward with measures that both achieve "cleaner air sooner" (i.e., prior to federal mandates being imposed) and make sense for South Carolina. State governmental agencies need to actively participate in this effort and have the opportunity to lead by example.

D.6. Smart Highways

South Carolina, as a party to the 8-hour Ozone Early Action Compact is required to submit an Early Action SIP revision by December 31, 2004. While it is understood that Transportation Conformity is not required as a part of this SIP revision, through interagency meetings, air quality and transportation officials agree on the importance of considering air quality goals in transportation planning. As a result, the parties involved in the interagency meetings developed a Smart Highways checklist to be used in transportation planning. This checklist is intended solely as an informational guideline to be used in reviewing Long Range Transportation Plans and Transportation Improvement Programs for adequacy of their documentation and will be used during long range transportation plan updates as required by 23 CFR 450.322. A copy of the Smart Highways Checklist is attached in Appendix 12. Air quality and transportation officials engaged in these interagency meetings include the Metropolitan Planning Organizations (MPOs) from the deferred nonattainment EAC areas (Anderson Area Transportation Study (ANATS), Greenville-Pickens Area Transportation Study (GPATS), Spartanburg Area Transportation Study (SPATS) and the Columbia Area Transportation Study (COATS)), the South Carolina Department of Transportation, Federal Highway Administration South Carolina Division, EPA Region 4, Federal Transit Administration, and the South Carolina Department of Health and Environmental Control.

Implementation of this process will assist deferred nonattainment areas, mentioned above, in considering air quality goals in transportation planning. Also, in the event that deferral of the effective date of the nonattainment designation is withdrawn, these areas will be fully prepared to address the full regulatory requirements of Transportation Conformity.

Parties involved include:

1. Metropolitan Planning Organizations – The MPOs were created by federal highway and transit statutes for the spending of federal highway or transit funds within the MPO boundaries and have the authority for planning, programming, and coordination of federal highway and transit investments. MPOs subject to this process are the ANATS, GPATS, SPATS and COATS.
2. South Carolina Department of Health and Environmental Control - Signatory to the 8-hour Ozone Early Action Compacts; Designated pursuant to South Carolina law and by the EPA as the state air quality planning agency and as the state administrator of the approved Air Quality Program for the State of South Carolina.
3. South Carolina Department of Transportation - Designated as the State transportation planning agency under South Carolina law to carry out the statewide transportation planning process required by Title 23 U.S.C. 135, and has the authority for planning, programming, and coordination of federal highway and transit investments in areas that are not within the MPO boundaries.
4. United States Department of Transportation - Federal Highway Administration South Carolina Division Office and the Federal Transit Administration - Agencies of the United States Department of Transportation responsible for review and approval of the conformity determinations prepared for compliance with 23 U.S.C. and 49 U.S.C., respectively.
5. Environmental Protection Agency Region 4 - Signatory to the 8-hour Ozone Early Action Compacts; Responsible for approving Early Action Compact SIP and providing comment on conformity determinations.

D.7. Contingency Planning

Transportation Conformity Memorandum Of Agreement

While contingency measures are not specifically required as a part of the EAC process, the Department offers the following as additional support to the EAC “fail-safe” provisions to ensure a seamless transition to address transportation conformity should an area be required to revert to the traditional nonattainment requirements.

The Department was required by 40 CFR Part 51 Subpart T §51.390 to amend the SIP by removing any previously applicable implementation plan transportation conformity requirements and submitting a revision to the SIP meeting the requirements of 40 CFR Part 93 Subpart A. The Department chose to develop a Memorandum of Agreement (MOA) between all required parties to satisfy the interagency consultation (federal, state, and local) process required for Transportation Conformity. As per the Clean Air Act, the parties to the MOA include the Environmental Protection Agency (EPA), U.S. Department of Transportation (USDOT), S.C. Department of Transportation (SCDOT), S.C. Department of Health and Environmental Control, Metropolitan Planning Organizations (MPOs), and any applicable transportation planning agency. The

Department included all MPO's in South Carolina as a party to the MOA. Further, the MOA is not specific for any one National Ambient Air Quality Standard (NAAQS), and may be applied to any area designated nonattainment for any NAAQS. EPA approved this SIP amendment by publication in the *Federal Register* (69 FR 4245) on January 29, 2004.

With the approval of this SIP revision, once an area in South Carolina is deemed nonattainment and is required to implement Transportation Conformity, the necessary steps regarding the consultation procedures are in place, as required. This is evident with the Rock Hill-Fort Mill Transportation Study Area (RFATS) MPO, which was designated nonattainment for the 8-hour ozone standard on April 15, 2004. In June 2004, consultation meetings following the Transportation Conformity MOA began and continue to date.

Areas in South Carolina that were designated nonattainment for the 8-hour ozone standard but had the effective date of the designation deferred as a result of the Early Action Compact are not required to implement transportation conformity (i.e. Anderson-Greenville-Spartanburg and Columbia). If at anytime the designation becomes effective, the Transportation Conformity MOA will be followed. However, in an effort to ensure that air quality goals are considered in transportation planning purposes, through interagency meetings, air quality and transportation officials agree on the importance of considering air quality goals in transportation planning. As a result, the parties involved in the interagency meetings developed a Smart Highways checklist (Appendix 12) to be used reviewing Long Range Transportation Plans and Transportation Improvement Programs for adequacy of their documentation and will be used during long range transportation plan updates as required by 23 CFR 450.322. The Transportation Conformity MOA was used as a basis for developing the Smart Highways membership, checklist and overall purpose. This ensures all parties involved that if an area is required to implement Transportation Conformity, preliminary review of the transportation plans, programs and projects will already be in place.

Attachment E
Maintenance for Growth

E.1 Maintenance for Growth

To address emissions growth for five years beyond 2007, the Department developed a 2012 emissions inventory to be used in a second future year modeling analysis. The Department also developed a 2017 emissions inventory to be used in third future year modeling analysis. These emissions inventories were developed in a manner similar to the 2007 emissions inventory as described in Attachment B. The results from the 2012 and 2017 modeling analyses are discussed below.

The draft attainment demonstration procedures for 8-hour ozone differ from those for 1-hour ozone in several ways. A key difference is that the modeled attainment test is based on relative, rather than absolute, use of the modeling results. Thus, the test relies on the ability of the photochemical modeling system to simulate the change in ozone due to emissions reductions, but not necessarily its ability to simulate exact values for future-year ozone concentrations. Another difference is that the 8-hour attainment test is site-specific while the 1-hour test focuses on an urban-scale modeling domain. For 8-hour analysis, areas of the domain that are not monitoring sites are only considered as part of a “screening” test.

For a monitoring site to pass the attainment test, its future-year estimated design value must not exceed 84 ppb. Future-year estimated design values (EDVs) are calculated for each site, for each simulated day, using “current-year” design values and relative reduction factors (RRFs) derived from future-year and base-year modeling results. The current-year design value for a given site is the three-year average of the annual fourth highest measured 8-hour ozone concentration. The RRF is the ratio of future- to base-year 8-hour maximum ozone concentrations in the vicinity of that monitoring site. The EDV is obtained by multiplying the current-year design value by the RRF.

Maximum current and estimated design values for the nonattainment sites in South Carolina are given in Table E-1 (A, B, and C). This table shows the calculations of the relative reduction factors for 2012 and 2017. For the Anderson/Greenville/Spartanburg nonattainment area, these sites are the Powdersville monitor located in Anderson County and the North Spartanburg Fire Station monitor located in Spartanburg County. For the Columbia nonattainment area this site is the Sandhill monitor located in Richland County. Table E-2 contains the maximum current and estimated design values for all of the monitoring sites in South Carolina. These monitors are grouped by geographic area. The calculation process for the relative reduction factor is the same as used in Table E-1 (A, B, and C). The EDVs were calculated using the 2012 and 2017 future year baselines as the bases for calculation of the RRF. For all sites, the EDV for 2007 is lower than the 1997-1999 DV, and the EDV for 2012 is lower than both the 1997-1999 DV and the EDV for 2007. For 2017, the EDV is lower than the EDV for 2012 for all sites except for Cape Romain. In addition, the values for all sites are less than or equal to 84 ppb. The 2001-2003 design value for these sites is also included in the table; the 2001-2003 design value was the data used to determine South Carolina’s 8-hour ozone attainment status. The monitors indicating non-attainment based on 2001-2003 design values are shaded.

Table E-1a.
Simulated current and future year 8-hour ozone concentrations for the Powdersville (Anderson County) site for the Anderson/Greenville/Spartanburg area.

Simulation Date	Simulated Maximum 8-Hour Ozone (ppb)		
	1998	2012	2017
5/18/98	79	69	68
5/19/98	76	63	60
5/20/98	82	65	63
5/21/98	71	59	59
5/22/98	72	63	62
5/23/98	70	61	58
Average	75	63	61
EDV Calculations			
RRF		0.84	0.81
1997-1999 DV		96	96
2001-2003 DV		86	86
EDV (1999)		81	78

Table E-1b.
Simulated current and future year 8-hour ozone concentrations for the North Spartanburg Fire Station (Spartanburg County) site for the Anderson/Greenville/Spartanburg area.

Simulation Date	Simulated Maximum 8-Hour Ozone (ppb)		
	1998	2012	2017
5/18/98	78	69	69
5/19/98	77	64	64
5/20/98	82	67	66
5/21/98	76	63	62
5/22/98	74	68	67
5/23/98	72	65	65
Average	76	66	65
EDV Calculations			
RRF		0.87	0.86
1997-1999 DV		93	93
2001-2003 DV		87	87
EDV (1999)		81	80

Table E-1c.
Simulated current and future year 8-hour ozone concentrations for the Sandhill (Richland County)
site for the Columbia area.

Simulation Date	Simulated Maximum 8-Hour Ozone (ppb)		
	1998	2012	2017
5/18/98	60 ¹	58 ¹	58 ¹
5/19/98	90	74	73
5/20/98	81	66	64
5/21/98	78	63	62
5/22/98	81	66	66
5/23/98	73	71	70
Average	80	68	67
EDV Calculations			
RRF		0.85	0.84
1997-1999 DV		91	91
2001-2003 DV		88	88
EDV (1999)		77	76

¹ Since the 5/18/98 maximum ozone concentration is less than 70 ppb, this day's ozone concentrations are not used in the calculation of the RRF.

Table E-2.
1997-1999, 2001-2003 8-hour ozone design values and 2012 and 2017 estimated ozone design values
for South Carolina ozone monitors.

Area/County	Monitor Name	1997-1999 Design Value (ppb)	2001-2003 Design Value (ppb)	2012 Estimated Design Value (ppb)	2017 Estimated Design Value (ppb)
Aiken/Augusta					
Aiken	Jackson	89	81	73	69
Barnwell	Barnwell	88	78	71	70
Edgefield	Trenton	86	80	70	67
Richmond, GA	Augusta	92		75	75
Anderson/Greenville/Spartanburg Area					
Abbeville	Due West	87	82	70	66
Anderson	Powdersville	96	86	81	78
Cherokee	Cowpens	91	84	78	76
Oconee	Long Creek	87	84	72	71
Pickens	Clemson	91	84	77	75
Spartanburg	N. Spartanburg Fire Station	93	87	81	80
Union	Delta	83	81	67	65
Columbia Area					
Richland	Parklane	89	80	77	77
Richland	Sandhill	91	88	77	76
Richland	Congaree Bluff	72	77	63 ¹	62 ¹
Darlington/Florence Area					
Darlington	Pee Dee	88	82	75	73
Rock Hill Area					
Chester	Chester	92	84	77	76
York	York	87	84	75	72
Coastal Sites					
Berkeley	Bushy Park	79	72	67	67
Charleston	Army Reserve	76	71	66	65
Charleston	Cape Romain	80	72	68	69
Colleton	Ashton	83	77	66	64

Area/County	Monitor Name	1997-1999 Design Value (ppb)	2001-2003 Design Value (ppb)	2012 Estimated Design Value (ppb)	2017 Estimated Design Value (ppb)
Williamsburg	Indiantown	75	71	61	60

¹ Since the Congaree Bluff design value for 2001-2003 is higher than the 1997-1999 design value, the 2001-2003 design value was used in the estimated design value calculation for 2012, and 2017.

Application of the modeled attainment test for 2012 and 2017 indicate that:

- The average EDV for 2012 is approximately 13 ppb lower than the 1997-1999 observation-based design value. The average EDV for 2017 is approximately 16 ppb lower than the 1997-1999 observation-based design value.
- 2012 and 2017 EDVs for all sites are less than or equal to 84 ppb.

The attainment test is passed for all sites for the 2007, 2012, and 2017 scenarios.

Additional information on South Carolina's ozone modeling is available in the following appendices. Appendix 3 contains the technical protocol for the modeling analysis, Appendix 4 contains the executive summary for the ozone modeling technical support document, and Appendix 5 contains the technical report summarizing the methods and results of the photochemical modeling application for South Carolina. The modeling effort included the application of the variable-grid Urban Airshed Model (UAM-V) photochemical modeling system for one multi-day simulation period, evaluation of model performance, and use of the modeling system to estimate ozone concentrations for 2007, 2012, and 2017.

E.2. Maintenance Plan

Although the EAC process does not require a maintenance plan to be submitted with the attainment demonstration, the Department intends to implement a maintenance plan similar to what is required in Section 175A of the Clean Air Act.

The following describes the commitments by the Department for the EAC maintenance plan, its update in 2015, annual tracking of both stationary and mobile sources and a continuing planning process under the Early Action Compact. These commitments are in force unless the 8-hour ozone standard is revoked in the future or is no longer deemed as the appropriate approach or the EAC process is removed. The Department believes that would happen only in the event that the U.S. Environmental Protection Agency (EPA) revises or revokes the current 8-hour ozone standard of 0.08 parts per million.

Normally, the maintenance plan is submitted after the attainment demonstration State Implementation Plan (SIP) has been submitted and implemented, typically 3 to 5 years later, depending on the actual attainment date. However, the process is different under the EAC SIP. The Department will prescribe that the EAC SIP covers not only the attainment demonstration through 2007, but also the first ten-year period of the

maintenance plan, 2007-2017, including a mid-point evaluation in 2012. As a part of this EAC SIP submittal we have included the 2007 attainment demonstration modeling, the 2012 maintenance demonstration modeling, and additional maintenance demonstration modeling for 2017.

In addition to the 10-year maintenance plan demonstration, the Department will update the maintenance plan 8 years after the area is redesignated to attainment. The updated maintenance plan will cover the 10 years following the expiration of the first 10-year period of the original maintenance plan. The Department will develop the maintenance plan for the period 2017 – 2027 on the following schedule:

1. 2013: Begin emission inventory analysis work. This start date will allow the Department to use the 2010 U.S. Census information in the emission inventory development.
2. 2015: Complete emission inventory analysis work and submit updated maintenance plan to the EPA.

The Department's maintenance plan does not include contingency measures in the EAC SIP since the provisions in the EAC SIP are to address both attainment and maintenance needs and will remain as part of the SIP throughout the attainment and 20-year maintenance periods. Further, the modeling analysis for 2012 and 2017 show a downward trend in emissions, as well as expected air quality values. The Department believes that the contingency measure adoption approach as outlined in the following Annual Tracking for Growth mechanisms is the most appropriate way to address the contingency provisions.

Annual Tracking for Growth

The EAC requires the following elements be tracked in order to ensure that the standard is maintained:

1. An annual review of growth (especially highway mobile and stationary point source) to ensure emission reduction strategies and growth assumptions are adequate;
2. Identification and quantification of federal, state, and/or local measures indicating sufficient reductions to offset growth estimates.

Stationary Point Sources

To meet the annual review of growth of stationary point sources, the Department will do the following analysis. The obligation to conduct these analyses and, where indicated, adopt and implement additional control measures based on the result of the analyses, lasts throughout the maintenance period (2027).

Beginning with the December 2005 biannual progress report, every year the Department will evaluate the most recent annual stationary source emission inventory completed by the Department. The stationary point source emission inventory for NO_x will be

compared to the 1998 annual inventory used in the air quality modeling analyses for the attainment demonstration.

Highway Mobile Sources

To meet the annual review of growth in highway mobile sources, the Department will do the following analyses:

Beginning with the December 2005 biannual progress report, each year the Department will evaluate the most recent annual VMT data available. The actual annual growth rate from 1998 will be compared to the average annual growth rate used in the modeling analysis from 1998 through 2007.

Air Quality Analysis

For purposes of determining if an area has a corresponding increase in ozone, the Department will review and report each December:

- Design Value Trends – Most recent design values (3 year average of the 4th highest 8-hour ozone average), compared to the trend in design values from the 1997-1999 timeframe to present.
- 8-Hour Ozone Exceedances – Number of exceedances of the 8-hour ozone standard at each monitor in the EAC areas for the most recent ozone season, compared to the number of exceedances at each monitor from 1997 to present.
- 1-Hour Ozone Design Value Trends – Most recent 1-hour ozone design values compared to the trend in 1-hour ozone design values from the 1997-1999 timeframe to present.
- 4th Highest Value Trends – 4th Highest 1-hour ozone value compared to the 4th highest 1-hour ozone value from 1997 to present.
- 1-Hour Ozone Exceedances – Number of exceedances of the 1-hour ozone standard at each monitor in the EAC areas for the most recent ozone season, compared to the number of exceedances at each monitor from 1997 to present.
- Weather Patterns – Discussion of weather patterns and climatology in most recent ozone season.

Continuing Planning Process

In addition, the EAC protocol requires a continuing planning process, including modeling updates (if needed) and modeling assumption verification. Since the larger source sectors for NO_x emissions will be covered in the annual stationary point source and highway mobile source evaluation discussed above, the Department proposes to evaluate in 2008 whether a full modeling update is needed for the EAC areas. At this point, the Department will use the full emission inventories submitted as part of the Consolidated Emissions Reporting Rule (CERR) process. Emissions will have been inventoried for calendar year 2005. These emissions will be used to evaluate whether a full modeling update is needed. These emissions can also be used to determine if a particular source

sector is growing at a higher growth rate than previously forecast, and if so, whether contingency measures should be implemented in the event the sector began causing 8-hour ozone standard violations. The State may conduct any of the above analyses and reviews on a combined area basis as appropriate to utilize resources more effectively.

General Timeline

- December 2004 – The Department submits EAC SIP, covering both attainment date of 2007 and first 10-year maintenance period through 2017
- April 2005 – The Department and EAC areas implement EAC measures
- December 2005 – First annual tracking report is submitted
- December 2006 – Second annual tracking report is submitted
- December 2007 – Attainment date
- December 2007 – Third annual tracking report is submitted
- April 2008 – EPA designates area for the 8-hour ozone standard
- December 2008 – The Department completes evaluation of new emissions data.
- December 2008 – Fourth annual tracking report is submitted and continues for each year thereafter through the end of the maintenance period
- January 2013 – The Department begins work on 10-year maintenance plan update
- December 2015 – submits 10-year maintenance plan update
- December 2027 – 20 year maintenance plan and annual tracking for growth concludes

Attachment F
Public Involvement

F. Public Involvement

A Notice of Drafting (NOD) was published in the South Carolina *State Register* on August 23, 2002, expressing the desire to pursue an early action plan that provides for ambient air in South Carolina that meets the more restrictive national standard prior to the federal deadline(s). The NOD requested those interested in participating in an early action plan for ground-level ozone provide that interest in writing to the Department. Due to the timing of events and the requirements of the State's Administrative Procedures Act, a second drafting notice was published in the *State Register* on April 25, 2003, the purpose of which was to extend the comment period.

To generate interest in this process, the Department established a large stakeholder group consisting of federal, state and local government officials, environmental groups, citizens groups, business, industry and private citizens. The initial stakeholder list, generated by staff and including those requesting to participate as a result of the NOD was submitted to EPA as a part of the June 2003 Progress Report. On August 26, 2002, correspondence was issued to stakeholders, seeking active participation in the development of an Early Action Compact (EAC) regarding ground level ozone reduction in South Carolina and providing a list of informational forums scheduled throughout the state. Copies of the correspondence and associated attachments sent to the stakeholders as well as copies of the sign-in sheets, meeting agendas and survey forms were submitted to EPA as a part of the June 2003 Progress Report. Informational forums seeking active participation in the development of an EAC were held on the following dates:

October 1, 2002 – Columbia
October 3, 2002 – Greenville
October 8, 2002 – Florence
October 10, 2002 – Rock Hill
October 15, 2002 – Aiken
October 16, 2002 - Charleston

Local stakeholder participation was obtained through the involvement of the county administrators and/or county councils. On November 12, 2002, the South Carolina Association of Counties issued correspondence to each county council chairman and county chief administrative officer stating support of each county's participation in the 8-hour ozone EAC. Also on November 12, 2002, the Department issued correspondence to county administrators seeking active stakeholders for participating in the EAC. This correspondence included a working draft copy of the EAC. As a result, Department staff participated in numerous county council meetings and other discussions (telephone and electronic mail) with county officials seeking local participation in the EAC process. Dates of these meetings were submitted to EPA as a part of the June 2003 Progress Report. On December 12, 2002, Department staff presented at the yearly meeting of county administrators sponsored by the South Carolina Association of Counties. At the request of several counties and the Association of Counties, the Department again issued

correspondence to the county's seeking participation. Copies of these correspondence were submitted to EPA as a part of the June 2003 Progress Report.

As of December 31, 2002, forty-five of the forty-six counties in South Carolina elected to become active stakeholders in the South Carolina Early Action process. In December 2002, the Department submitted to EPA the compacts signed by the respective local participant and R. Lewis Shaw the Deputy Commissioner for the Department's Environmental Quality Control. (See Appendix 2)

One condition set by EPA Region 4 for York, Chester, and Lancaster counties participating in the EAC requires that South Carolina continue to actively participate in the Charlotte Region Integrated Air Quality Management Pilot Project. This project has since been renamed "Sustainable Environment for Quality of Life" (SEQL). In addition to the milestones established in the Early Action Compact, South Carolina and North Carolina were required to develop a specific memorandum of understanding (MOU) detailing how this requirement will be met. On March 14, 2003, Mr. R. Lewis Shaw and Mr. William G. Ross, Jr., Secretary for the North Carolina Department of Environmental and Natural Resources signed the MOU. A copy of the MOU was submitted to EPA as a part of the June 2003 Progress Report.

South Carolina was not required to enter into a formal agreement with the state of Georgia in regards to emission reduction strategies for the Upper and Lower Savannah areas. However, representatives from the state of Georgia attended the Lower Savannah Council of Government meeting held on February 6, 2003. Representatives from EPA also attended this meeting. In addition, Department staff attended a meeting held on February 21, 2003, in Augusta, Georgia, with local and state government officials from Georgia and South Carolina and EPA to discuss the impact of the EAC process and emission reduction strategies for that area.

The Department held meetings in ten different areas around the state. These meetings were held at the local Council of Government (COG) office and were "kick-off" meetings with the local participating areas (i.e., county officials; COG representatives; EPA attended three; and, where applicable adjoining state representatives). Included as a part of the June 2003 Progress Report, was the correspondence issued on January 27, 2003, to the county contacts, which included resources such as the Air Quality Improvement Tools for Local Governments. The dates and locations of these meetings were:

January 27, 2003 – Santee Lynches Council of Governments
January 28, 2003 – Central Midlands Council of Governments
January 30, 2003 – Appalachian Council of Governments
February 3, 2003 – Pee Dee Council of Governments
February 4, 2003 – Upper Savannah Council of Governments
February 5, 2003 – Berkeley-Charleston-Dorchester Council of Governments
February 6, 2003 – Lower Savannah Council of Governments
February 10, 2003 – Catawba Council of Governments

February 11, 2003 – Waccamaw Council of Governments
February 13, 2003 – Low Country Council of Governments

In addition to activities related to assisting local EAC areas with the development of their local strategies, the Department worked with stakeholders to develop statewide regulations to achieve additional reductions in ozone precursors as part of the EAC process. Starting in the Spring of 2003, the Department began meeting with stakeholders representing various industries, environmental and local government groups. The stakeholders were divided into two groups. The first group was formed to review the existing Open Burning Regulation to determine possible revisions to this regulation that would assist with the EAC efforts. The second group had a broader mission which was to review existing regulations for stationary sources and also promulgate a new regulation to achieve additional reductions in ozone precursors. These groups met monthly for the remainder of 2003 and the product of these meetings was a package of regulations that were submitted to the Board of Health and Environmental Control (Board). The Board conducted a public hearing on these regulations on January 8, 2004. The regulations were then submitted to the South Carolina State Legislature in January for their review and approval.

The Department also conducted three EAC Updates that were broadcast live on the following dates: February 26, 2003, June 25, 2003, and August 18, 2004. Finally, a public hearing on the entire EAC SIP package was conducted on November 22, 2004.

Notification of these updates was provided to all stakeholders and was also included on the Department's website. The updates were held in the Peeple's Auditorium at the Department's Columbia office and were broadcast to the Department's Environmental Quality Control offices around the state. The updates provided information on the latest efforts regarding modeling, statewide regulatory changes, and emission reduction activities of the state and local areas and provided the opportunity for comment.

Throughout this process, the Department issued numerous press releases, news publications, television reports, and ozone education/outreach initiatives regarding the early action process. Specific information and appropriate copies have been and will continue to be submitted to EPA as a part of the routine progress reports, every six months.

Furthermore, the Department established a website (www.scdhec.net/baq/eap.html) for stakeholders to obtain updated information regarding the early action process. The website address was given in the initial press release (August 28, 2002) and continues to be included on correspondence and presentations. Several counties also include information on their respective website and also provide a link to the Department's website. Information regarding the individual county websites may be found in the progress reports.